DIRECT TESTIMONY OF

DAVID K. PICKLES

ON BEHALF OF

DOMINION ENERGY SOUTH CAROLINA, INC.

DOCKET NO. 2019-239-E

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION.

A. My name is David K. Pickles. My business address is 7160 North Dallas Parkway, Suite 340, Plano, Texas 75024. I am employed by ICF Resources, L.L.C. ("ICF") as Senior Vice President.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of Dominion Energy South Carolina, Inc. ("DESC" or the "Company").[1]

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I am a 1986 graduate of the University of Wyoming with a Bachelor of Science Degree in Economics and a 1988 graduate of the University of Wyoming with a Master of Science Degree in Regulatory Economics. I have 30 years of experience in the planning, implementation, and evaluation of utility Demand Side Management ("DSM") programs. I have been employed by ICF for approximately 15 years, and currently serve as Senior Vice President in the Commercial Energy

[1] South Carolina Electric & Gas Company changed its name to Dominion Energy South Carolina in April 2019, as a result of the acquisition of SCANA Corporation by Dominion Energy, Inc. For consistency, I refer to the Company as DESC throughout my testimony.

Practice. Prior to joining ICF, I was employed by: Navigant Consulting as Director in the energy efficiency practice; PHI Consulting, where I served as interim Chief Technology Officer for Honeywell's Energy Information Services business unit; Central and Southwest Utilities (now AEP) as Vice President of Marketing, Development, and Operations for the unregulated energy services group; and Synergic Resources Corporation as a Director in the energy efficiency practice. I also have experience as a utility regulator, having previously held positions as Utility Specialist and Senior Utility Analyst with the Iowa Consumer Advocates Office, and Utility Analyst II with the Iowa Utilities Board, where I was responsible for helping develop positions and testimony regarding energy efficiency and integrated resource planning. I have led the development of over 100 individual demand side management programs, including: program design, establishment of incentives, forecasting of participation, cost-effectiveness testing, creation of marketing strategies, and estimation of implementation costs. I have also led the development of demand side potential studies for utility clients in Arizona, Arkansas, Delaware, Florida, Hawaii, Illinois, Iowa, Louisiana, Maryland, Michigan, Mississippi, Missouri, North Carolina, South Carolina, Texas, Virginia, Washington, D.C., and Wisconsin.

Q. PLEASE DESCRIBE ICF.

A. Founded in 1969, ICF is a consulting and professional services firm supporting the energy, environmental, health, technology, and aviation sectors. Publicly traded (NASDAQ: ICFI) with over 5,000 staff and $1.2 billion in annual revenue, ICF currently implements more than 170 demand side management

programs for 42 utilities in 28 states. ICF has also been the lead contractor for the Environmental Protection Agency's ("EPA") ENERGY STAR® program since its inception and also supports the U.S. Department of Energy's Better Buildings and Commercial Building Alliance programs.

Q. HAVE YOU EVER TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I testified in Docket Nos. 2008-196-E, 2009-261-E, and 2013-208-E. I have also testified before regulatory commissions in Arizona, Arkansas, Illinois, Iowa, Louisiana, Missouri, Nova Scotia, and Virginia on issues related to demand side management program planning, design, and policy, and other ratemaking topics.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony provides an overview of ICF's analysis of potential DSM programs on behalf of DESC. This analysis (the Dominion Energy South Carolina 2020–2029 Achievable DSM Potential and PY10–PY14 Program Plan or the "Potential Study") is provided as Exhibit No. ___ (DKP-1) attached to this testimony.

Specifically, my testimony explains the process by which ICF conducted the Potential Study, and concludes that the portfolio proposed by DESC represents a reasonable and balanced suite of programs.

Q. DO YOU HAVE ANY CORRECTIONS TO THE POTENTIAL STUDY PREVIOUSLY FILED AS A PART OF DESC'S INITIAL REQUEST IN THIS PROCEEDING?

A. Yes. There are four minor corrections. None of them have any impact on the analyses or conclusions of the Potential Study. The corrections are:

- Page 16, Table 6 - last row should be g/c (not h/c)
- Page 74, Table 57 - estimated Project Totals should be 4,687 (not 4,474)
- Page 78, Section 11.10.2 - should reference Table 60 (not 58)
- Page 78, Section 11.10.3 - table should reference 61 (not 59).

A corrected version of the Potential Study is attached as Exhibit No. ___ (DKP-1).

Q. WHAT WERE THE PRIMARY OBJECTIVES OF THE POTENTIAL STUDY?

A. The three primary objectives of the Potential Study were to: 1) develop projections of program implementation costs, 2) forecast resultant decreases in energy consumption, and 3) estimate the cost-effectiveness of the programs.

Q. WHAT PROCESS WAS USED TO MEET THESE OBJECTIVES?

A. The primary steps in the process included:

1. **Identification and characterization of the technologies** or "measures"[2] to be included in the analysis, and the development of related assumptions such as measure cost and load shape impact.
2. **Cost-effectiveness model development**, including development of planning assumptions such as the value to DESC of saved energy and demand, discount rates, and other inputs necessary to calculate cost-effectiveness.
3. **Eligible stock calculation**, whereby the number of inefficient measures in the DESC service territory which could potentially be replaced with efficient measures was estimated. This task included data collection on customer types in DESC's service area, the number and types of buildings, the types of energy-using equipment that are in each building type, and the current saturation of energy-efficient equipment.

[2] As used in this testimony, a "measure" is a single instance of a particular energy-efficient technology or activity, such as a single type of efficient lighting. A "program" is a bundle of efficient measures that are delivered within a single programmatic framework and may, for example, include many lighting technologies all delivered under one umbrella.

4. **Measure cost-effectiveness screening**, wherein each individual measure was assessed for cost-effectiveness under the Total Resource Cost (TRC) benefit cost test. This test compares the incremental cost of the efficient measure above its inefficient alternative with the savings associated with the reduced energy consumption, and is the test used by two-thirds of the states which use an individual test to establish the cost-effectiveness of their programs. Measures with a TRC test result consistently above 1.0 were passed to the next step of the analysis. Where applicable, non-energy benefits were included in the TRC calculations, including water and wastewater savings, natural gas savings, and avoided and deferred equipment replacement costs.

5. **Program Potential Analysis,** which included estimation of the achievable potential for programs containing all passing measures. This included developing cost and savings forecasts for programs under two scenarios: (1) a *current programs* scenario where DESC programs were modeled based on DESC's existing program designs, and (2) an *expanded programs* scenario, which included both existing programs (some of which were modified or expanded) and potential new programs.

6. **Cost-effectiveness and impact reporting**, including annual program participation, impact, cost, and savings estimates along with program and portfolio cost-effectiveness results.

Each of these steps is discussed in detail in Exhibit No. ___ (DKP-1). Additionally, during the Potential Study, there were several opportunities for stakeholder input. At the beginning of the Potential Study, the methodology and list of measures to be evaluated were presented to the Energy Efficiency Advisory Group. In addition, workshops were conducted with trade allies and contractors to present program ideas and receive feedback. Near the end of the Potential Study, draft results were presented to the Energy Efficiency Advisory Group, and feedback was incorporated into the final analysis and report.

Q. HOW DOES THIS POTENTIAL STUDY DIFFER FROM DESC'S LAST POTENTIAL STUDY IN 2009?

A. This process builds upon DESC's 2009 potential study in many ways. Some of the most significant include:

1. It leverages DESC's experience implementing programs and refining programs since they were introduced in 2010. As such, it better reflects the attributes of the DESC customer base, as well as the needs and capabilities of the trade ally community.
2. It includes extensive new service territory specific data. As a part of this Potential Study, approximately 750 new surveys and site inspections were completed, giving DESC detailed insight into its customers' current uses of energy and opportunities to increase efficiency.
3. It reflects significant changes to codes and standards since the 2009 study. These standards have served to significantly reduce cost-effective opportunities for lighting, and are increasingly diminishing future opportunities for HVAC based measures.
4. It incorporates non-energy benefits (including water and wastewater savings, natural gas savings, and avoided and deferred equipment replacement costs) in the assessment of cost-effectiveness.
5. It reflects the fact that a significant number of DESC's largest customers have elected to opt-out of the DSM programs, significantly reducing DESC's ability to pursue energy savings with the large customer base.
6. It reflects the increasing natural adoption of certain energy efficiency measures.
7. It updates the assumed costs of measures, reflecting the fact that the costs of some measures have changed significantly since the previous study, and
8. It reflects DESC's updated capacity availability, and the resulting changes in DESC's avoided capacity and energy costs.

Q. PLEASE DESCRIBE HOW THE LOAD REDUCTIONS ASSOCIATED WITH THE ENERGY EFFICIENCY ("EE") MEASURES WERE VALUED.

A. Each kilowatt ("KW") saved by a measure was valued based on DESC's avoided cost of capacity. Each kilowatt hour ("kWh") saved was valued based on DESC's avoided cost of energy. For the avoided capacity cost calculation, a generation resource plan populated with combustion turbines ("CTs") is used. DESC calculates the incremental capital investment related revenue required to support the CT resource plan. DESC derives a change case in its resource plan by adding a 100 megawatt ("MW") purchase then adjusting the expansion plan accordingly. The difference in the revenue requirement between the base case and

the change case defines the avoided capacity cost. For EE, that value is multiplied by 63.7%, which is the percentage of EE available at winter peak. For the purposes of this calculation, a value of $63.37 per KW (in 2019 dollars), which is inclusive of transmission and distribution, was used along with the application of a 15% peak line-loss factor and a 14% reserve margin factor.

For the avoided energy cost calculation, the base case is defined by DESC's existing fleet of generators plus any projected future generators, as well as the solar facilities with which DESC has executed a power purchase agreement. The change case is the same as the base case except that the hourly loads are reduced by a 100 MW EE profile. The avoided energy cost is the difference between the base case costs and the change case costs. For the purposes of this calculation, a value of $0.0358 per kWh (in 2019 dollars) was used, followed by the application of an 8% average line-loss factor.

Q. WILL THE AVOIDED COST FOR DSM BE REEVALUATED AND UPDATED DURING THE FIVE-YEAR PERIOD?

A. In order to provide a consistent set of planning assumptions, predictable availability of programs, and stable program designs, I recommend that the reevaluation of avoided costs be done concurrently with the planning of programs for the next five-year cycle, not midstream within each cycle. This stability will enhance DESC's ability to offer long-run programs that trade allies and customers can become familiar with and rely upon. It also permits DESC to more reliably predict the cost-effectiveness and financial performance of the portfolio. In the event that market conditions change significantly during that five years, DESC may

elect to update the avoided costs for future, forward-looking program planning. Such updated avoided costs should not be used for retrospective assessments of the existing programs nor for the calculation of shareholder incentives based on program results achieved prior to the update.

Q. PLEASE SUMMARIZE THE RESULTS OF THE MEASURE SCREENING.

A. In total, ICF analyzed 454 measure types and 1,442 measure permutations (an application of a measure in a specific building type) for this Potential Study. Descriptions of each measure type and permutation appear in Appendix D of Exhibit No.___ (DKP-1) along with each measure's cost-effectiveness results. Table 1 shows the number of measures evaluated for cost-effectiveness and the number that have TRC benefit cost ratios above 1.0. About 70% of the measures evaluated were found to be cost-effective and were therefore included in the energy efficiency programs.[3]

[3] In most cases, only measures with a TRC of 1.0 or higher were included in a program. An exception to this rule for non-cost-effective measure permutations was made when most of the permutations of that measure type were cost-effective. For example, if a measure type was cost-effective for a majority of, but not all, applicable building types, the measure type was included for all building types since excluding participation by customers in a specific building type can be impractical in implementation. Also, if a measure was cost-effective for a minority of building types, ICF excluded all permutations of the measure in the potential analysis since it can be impractical in implementation to limit participation to certain building types. In certain cases, non-cost-effective measures were included in a program if it was believed that the measure should remain for reasons such as reducing the entry barrier for other measures or meeting the needs of hard-to-reach customers.

Table 1. Number of Measures Tested for Cost-Effectiveness and Included in the Analysis

Subsector	Measure Types Tested for Cost-Effectiveness	Total Measure Permutations Tested for Cost-Effectiveness	Number of Measure Types Passing Cost-Effectiveness Screening Included in the Analysis	Number of Measure Permutations Passing Cost-Effectiveness Screening Included in the Analysis
Residential	152	337	101	223
Commercial	203	447	144	318
Industrial	93	644	69	478
Agricultural	6	14	6	13
TOTAL	**454**	**1,442**	**320**	**1,032**

Q. HOW WERE THE PASSING MEASURES INCORPORATED INTO PROGRAMS?

A. The measures were bundled into seven residential and three non-residential program types, including:

Residential Programs

- **Appliance Recycling** – Promotes the retirement and recycling of inefficient, working refrigerators and freezers from households by offering incentives and free pick-up and responsible recycling of the equipment.
- **Heating, Cooling, and Water Heating** – Promotes investment in long-term savings by providing rebates for the purchase and installation of high-efficiency home HVAC equipment and heat pump water heaters. A new addition to the program is rebates for Air-Source Heat Pumps when replacing electric resistance heating and higher incentives to encourage the installation of 15 SEER units over baseline equipment (14 SEER equipment).
- **Home Energy Check-up** – Conducts audits of all residential home types to educate on home energy consumption and identify opportunities to save energy and money. The program offer two tiers of service. Tier 1 includes the in-home consultation and free direct installation of LED bulbs and faucet aerators. In addition, water heater and water pipe wrap insulation are left with customers with electric water heaters as well. Tier 2 includes the Tier 1 services, as well incentives of up to 75% of the cost air-sealing, home insulation, and other building shell measures.
- **Home Energy Reports** – Provides (electronically or through mail) information on energy use to home occupants that encourages them to save energy. This

information typically includes home energy use for the last month compared with historical energy use, and also compares the occupants' energy use with the energy use of similar homes. In the expanded case, the program switches from opt-in to an opt-out model.

- **Neighborhood Energy Efficiency** – Provides energy education, an on-site energy survey of the dwelling, and direct installation of select energy-saving measures at no additional cost for customers based on qualifying income levels. These are delivered in a door-to-door "sweep" approach in neighborhoods that have a significant number of households with low income, defined as ≤ 150% of the federal poverty guidelines.
- **EnergyWise Savings Store** (Online Store) – Provides rebates for qualifying ENERGY STAR® lighting and smart thermostats through an online store, as well as education to increase customer awareness of energy-efficient appliances.
- **Multifamily** – Provides energy education, an on-site energy survey of the dwelling, and direct installation of select energy-saving measures specific to multifamily customers. In addition, energy efficiency measures are recommended for common areas to include LED lamps and/or fixtures and will result in incentives for property owners.

Commercial and Industrial Programs

- **EnergyWise for Your Business** – A prescriptive element of the program provides incentives to customers per measure based on deemed savings. A custom element identifies and implements site-specific and unique cost-effective energy efficiency opportunities that are not available via the prescriptive element based on calculated savings for specific customer projects. Agricultural and strategic energy management focused measures are added to the program to meet the specific needs of commercial businesses.
- **Small Business Direct Install** – Implements energy efficiency projects for customers whose usage is under 300 megawatt-hours ("mWh") annually and with no more than five accounts owned by a single customer. These customers include convenience stores, offices, garages, warehouses, restaurants, and other smaller businesses. The program measures are directly installed for the customers and are primarily lighting and refrigeration focused.
- **Municipal LED Lighting** – Provides incentives for municipal customers to convert municipal street lighting from high-intensity discharge to LED (solid state).

Q. HOW WERE THE COSTS OF EACH PROGRAM DEVELOPED?

A. Total program costs were estimated based on a combination of DESC's prior experience and the experience of other utilities implementing similar programs, adjusted as necessary to reflect the scale and other unique

characteristics of DESC's programs. Program costs generally included the following:

- Administrative costs
- Implementation and delivery costs
- Quality Assurance/Quality Control costs
- Marketing costs
- IT costs
- Incentive processing costs
- Customer service costs
- Evaluation, Measurement, and Verification costs, and
- Other program costs.

The annual costs associated with each program are detailed in the Individual Program Descriptions section of Exhibit ___ (DKP-1).

Q. HOW WAS PROGRAM PARTICIPATION FORECASTED?

A. Participation rates were developed using one or more of the following:

- Primary research in DESC's service area on customer market barriers and acceptance rates at different incentive levels
- ICF implementation experience
- Historic participation in the program
- Participation in similar programs offered by other utilities
- The incentive strategy and level (percentage of incremental cost rebated) and resulting customer payback period
- Turnover in the stock of baseline equipment
- Level of new construction and/or major remodeling
- Changes in future codes and standards
- Trade ally feedback, and
- The level of marketing and promotion.

All participation forecasts included consideration of free ridership (i.e., program participants who would have taken the energy efficient action even in the

absence of the program and who therefore provide no "net" benefit). For all measures and programs that are currently offered by DESC, free-ridership was estimated based on actual DESC program impact evaluation results. Free-ridership for new measure types and programs was estimated by ICF based on program implementation experience.

Further details on these approaches are provided in Exhibit No. ___ (DKP-1).

Q. HOW WAS PROGRAM COST-EFFECTIVENESS EVALUATED?

A. Program cost-effectiveness was evaluated using the program-level TRC test. The components of this test are summarized in Table 2.

Table 2. Program-Level TRC Test Components

Question Answered	Benefits	Costs
Will the net cost of all resources necessary to supply service across all utility services decrease? A benefit/cost ratio >1.0 indicates that net costs will decrease.	Net Electric Avoided Capacity Net Electric Avoided Energy Net Electric Avoided T&D Net Avoided Gas costs Net Customer O&M Savings Net Water/Wastewater savings	Measure Incremental Costs Program Operations (exc. Incentives) Cost Program Incentives Paid to "Free Riders"

Avoided capacity, energy, and transmission and distribution costs were valued in the same manner discussed above with respect to the measure-level TRC screening. Non-energy benefits included water and wastewater savings for measures such as low-flow showerheads, and natural gas savings for measures such as insulation in gas-heated buildings. Avoided and deferred equipment replacement cost savings were included for measures that have a longer estimated useful life than the technologies they are replacing. All costs and benefits were adjusted, where appropriate, to reflect "net" participation (that is, the program only takes credit for those participants who took the efficient action as a result of the program,

and not for those who would have taken the efficient action even in the absence of the program).

This is the same cost-effectiveness testing methodology previously approved by this Commission, with the exception of the incorporation of non-energy benefits. The incorporation of non-energy benefits generally serves to increase the cost-effectiveness of the programs.

Q. WHAT ARE THE RESULTS OF THE COST-EFFECTIVENESS ANALYSIS?

A. The results of the analysis are summarized in Table 3.

Table 3. Summary of Cost-Effectiveness Analysis

Program	TRC	Sum of Incremental for Program Years 10–14				
		Non-Incentive $	Incentive $	Total $	MWh	MW
Appliance Recycling	1.11	$2,547,062	$2,425,774	$4,972,836	14,149	1.7
H&C and Water Heating	1.02	$3,386,440	$11,702,348	$15,088,788	27,271	13.5
Home Energy Check-up	1.00	$6,808,468	$9,015,591	$15,824,059	27,406	6.1
Home Energy Reports	1.88	$895,740	$3,847,221	$4,742,962	24,473	9.3
Neighborhood Energy Efficiency	5.90	$969,974	$3,730,671	$4,700,645	24,439	2.8
Online Store	8.15	$345,799	$1,533,467	$1,879,266	19,799	1.7
Multifamily	1.76	$1,527,150	$3,442,875	$4,970,025	18,627	2.9
Residential Portfolio	**1.84**	**$16,480,633**	**$35,697,946**	**$52,178,580**	**156,164**	**37.8**
EnergyWise for Your Business	1.84	$18,672,720	$35,828,135	$54,500,855	252,196	57.1
Small Business Direct Install	1.91	$4,910,887	$8,184,812	$13,095,699	71,541	20.6
Municipal LED Lighting	2.37	$5,035,877	$14,957,202	$19,993,079	19,070	–
C&I Portfolio	**1.89**	**$28,619,484**	**$58,970,149**	**$87,589,633**	**342,807**	**77.7**
Total Portfolio	1.88	**$45,100,117**	**$94,668,095**	**$139,768,212**	**498,971**	**115.5**

As shown in Table 3, all programs are cost-effective, with TRC ratios ranging between 1.0 and 8.15. The TRC of the residential program portfolio is 1.84, and the commercial and industrial portfolio is 1.89. The TRC ratio of the entire portfolio is 1.88. Collectively, the programs save 115.5 MW of capacity and 498,971 mWh of energy. The total program expenditure over 5 years is $139.8

million. Detailed program-by-program results are provided in Exhibit No. ___ (DKP-1).

Q. WHY ARE THERE NO DEMAND RESPONSE PROGRAMS INCLUDED IN THE PORTFOLIO?

A. None of the demand response programs modeled were cost-effective over the upcoming 5-year program cycle, in part due to their limited impact on DESC's winter peak. Therefore, none are proposed for implementation at this time.

Q. DO YOU FIND DESC'S PROPOSED SHARED SAVINGS INCENTIVE MECHANISM TO BE APPROPRIATE?

A. Yes. A shared savings mechanism, which provides a small share of the net savings resulting from the programs to the utility as a shareholder incentive, is a widely used and effective means of aligning utility and customer interests. Such mechanisms encourage the utility to implement the programs as effectively as possible, and partially offset the financial disincentive that utilities have to invest in energy efficiency instead of investing in supply-side alternatives.

While the details of these mechanisms vary based on the specific circumstances of each utility and state commission, I believe that DESC's proposed mechanism, which provides an opportunity (but not a guarantee) to earn a shareholder incentive equivalent to 12.6%[4] of the expenditure, is consistent with industry norms and provides a reasonable balancing and alignment of customer and shareholder interests.

[4] A potential $2.8 million shareholder incentive on a total program costs of approximately $22.2 million.

Q. IN YOUR PROFESSIONAL OPINION, DO THE RECOMMENDED PROGRAMS CONSITITUTE AN APPROPRIATE PORTFOLIO OF DSM PROGRAMS FOR DESC?

A. Yes. The programs represent a significant expansion of DESC's programs, even in the face of increasingly stringent federal codes and standards. The programs are all cost-effective, and as a whole, the portfolio is very cost-effective. Further, the programs are specifically targeted to the unique needs of the DESC service territory, which includes comparatively high concentrations of residential, low-income, hard-to-reach, and rural customers. The programs are based on strong program logic and are being implemented successfully by other utilities. Further, the costs and participation rates associated with the programs are reasonable in light of the scale of the programs and the nature of the DESC service territory.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.